2015

Fungicide and Herbicide Effects on Gray Leaf Spot in Nebraska Field Corn, 2014

J. D. Harbour
University of Nebraska-Lincoln, jharbour2@unl.edu

T. A. Jackson-Ziems
University of Nebraska-Lincoln, tjackson3@unl.edu

CORN (*Zea mays*, DKC-64-83 RIB)
Gray Leaf Spot; *Cercospora zeae-maydis*

J. D. Harbour and T. A. Jackson-Ziems
Department of Plant Pathology
University of Nebraska-Lincoln
448 Plant Science Hall
Lincoln, NE 68583-0722

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The objective of the trial was to compare fungicide and herbicide treatments for gray leaf spot (GLS) efficacy. Corn was grown under normal, irrigated agronomic practices at the South Central Ag Lab near Clay Center, NE. Soils were a silt loam with 6.7 pH and 1.8% organic matter and the previous crop was corn. Reduced tillage was performed prior to planting. Corn (DKC 64-83 RIB, moderately susceptible to GLS) was planted at approximately 34,000 seed/A on 2 May. Seven treatments were arranged in a randomized complete block design with six replications. Fungicides were applied using a high-clearance sprayer equipped with a 10 ft wide spray boom housing six TeeJet XR11002 spray nozzles with 20 inch spacing. Spray solutions were delivered at 3 mph with 40 psi compressed air for a spray volume of 20 gpa. The treatments were applied to V5 growth stage corn on 19 Jun and to R1 corn on 22 Jul. Plots were assessed for phytotoxicity, stay green, and area under the disease progress curve (AUDPC) was calculated from three ratings conducted on 12 Aug, 9 Sep and 17 Sep. Stay green was measured by visually assessing the amount of green foliage in the plot. Corn stalk-lodging was assessed in the outer two plot rows (28 Oct) by pushing 20 random stalks at shoulder height to the 45° position from vertical. Plots were harvested on 19 Nov from the center two rows using a Gleaner K2 plot combine, and grain was corrected to 15.5% moisture. Data were analyzed using ANOVA, and means were separated using Fisher's protected LSD at $P = 0.10$. Average monthly temperatures for Jul and Aug were in the mid-80s (^{o}F). Precipitation was greater than normal in Jun (8.9 in. vs 2.9 in.), and 3.3 in of rain fell on 21 Jun. The longest dry spell occurred from 11 Jul to 31 Jul. An overhead linear sprinkler irrigated the trial on 22 Jul, 29 Jul, and 2 Aug and delivered approximately 1.75 in. of water on each date. Temperature (°F) highs were warmer than average in May, and the longest warm spell occurred from 18 May to 7 Jun. The hottest month was Jul with a high of 99°F on 21 Jul. High temperatures at the R1 growth stage ranged from the low-90s and decreased to the mid-70s.

Treatments applied at V8 or R1 did not cause phytotoxicity to corn (data not shown). AUDPC values were significantly lower in plots treated at R1 versus V8, Glyfos herbicide, and the nontreated check. AUDPC values were significantly lower in plots treated with Headline AMP (R1) and Fortix 5 oz (R1) compared to the other treatments. Stay green was significantly greater in plots treated with fungicides at R1 versus V8, Glyfos herbicide, and the nontreated check. Stay green was significantly greater in plots treated with Headline AMP at R1 versus the other R1-applied fungicides. Lodging was significantly lower in plots treated with Fortix 4 oz (R1) and Headline AMP (R1) compared to the other treatments. There were no significant differences between treatments for yield. Data indicated that R1-applied fungicides reduced GLS severity, increased stay green, and protected against lodging.

Treatment, Formulation, Rate/A[z]	Timing[y]	AUDPC[x] %	Stay Green[w] %	Push Lodging[v] %	Yield bu/A
Fortix 3.22 F, 5 fl oz + Glyfos 4 L, 32 fl oz	V8	646.3 ab[u]	72.3 c	18.6 abc	256.6
Headline AMP 1.66 SE, 10 fl oz + Glyfos 4 L, 32 fl oz	V8	703.5 a	70.5 c	20.3 ab	247.9
Glyfos 4 L, 32 fl oz	V8	659.2 ab	69.2 c	22.5 a	258.8
Fortix 3.22 F, 5 fl oz	R1	300.1 cd	81.7 b	8.3 bcd	250.4
Fortix 3.22 F, 4 fl oz	R1	335.2 c	84.3 b	5.4 d	258.2
Fortix 3.22 F, 5 oz	R1	228.9 de	86.8 b	11.3 a-d	254.2
Headline AMP 1.66 SE, 10 fl oz	R1	161.7 e	92.3 a	7.0 cd	249.9
Nontreated Check	-	590.3 b	69.7 c	19.1 ab	251.1
CV %		23.73	6.88	36.49	5.89

[z] All treatments were applied with NIS @ 0.25% v/v.
[y] V8 application = 19 Jun; R1 application = 22 Jul.
[x] Area under the disease progress curve calculated from three rating dates of 12 Aug, 3 Sep, and 17 Sep, 2014.
[w] Stay green was determined by visually estimating the percentage of green foliage in the plot.
[v] Push lodging = % lodged stalks when pushed from shoulder height to the 45° position from vertical.
[u] Data followed by the same letter or without letters within a column are not significantly different at $P = 0.10$ according to Fisher's protected LSD test.